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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,174	12/31/2003	Lukas Trosman	24GA127099	5555

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EXAMINER

AWAI, ALEXANDRA F

ART UNIT PAPER NUMBER

3663

DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/748,174	Applicant(s) TROSMAN ET AL.	
	Examiner Alexandra Awai	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

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suggests features that encompass the corresponding limitations of the current application. Orii et al. also teach that 10x10 and 9x9 rod matrices are established fuel assembly concepts.

The secondary reference shows that it is a well-known and advantageous expedient in the art to provide certain groupings of part-length rods, particularly a 3-rod subgroup (Fig. 19). Ueda et al. also discloses a plurality of voids formed above the upper ends of the shorter, or part-length, fuel rods (Fig. 25A). Note that a claimed configuration (11 or 14 part-length rods as opposed to 10 or 12) may be considered a matter of design choice which a person of ordinary skill in the art would have found obvious, absent persuasive evidence that the particular configuration was significant. Johansson et al. teach that the addition of part length rods lowers the pressure drop, thereby improving critical power. The number of part-length rods (e.g., in claims 27 and 30) is a matter of optimization within prior art conditions or through routine experimentation (See MPEP § 2144.05 II.A). The concept of including part-length rods in a fuel assembly in order to modulate shutdown is well-known (Ueda et al. column 12, line 65), and an optimization of a presently disclosed device is not considered patentably distinct from the original device. The applicant has not shown how the 3-rod group is functionally distinct from the 2-rod group, or that it is not an obvious variant.

It is inherent to fuel bundles including part-length rods that there may be voids at the end of the shorter rods. Claims 26, 29 and 32 are essentially reciting the absence of the portion of part-length rods that distinguishes them from full-length rods. The “void” feature is therefore structurally equivalent to the “part-length rods” feature, the object of which is to improve shutdown. As to limitations which are considered to be inherent in a reference, note the case law of *In re Ludtke*, 169 U.S.P.Q. 563; *In re Swinehart*, 169 U.S.P.Q. 226; *In re Fitzgerald*, 205

DETAILED ACTION

1. Claims 1-23 having been cancelled, new claims 24-33 have been examined.

Claim Objections

2. Claim 30 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Given that the 10x10 fuel bundle of claim 28 *consists* of two 3-rod part-length rod groups and eight additional part length rods, it is already defined as having a total of fourteen part-length rods within the 10x10 matrix.

Note that claims 25-27 depend upon a cancelled claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 24-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim language, being vague and indefinite, fails to clearly describe the disclosed invention. Note that claims 25-27 depend upon a cancelled claim, rendering it

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impossible for one of ordinary skill in the art to ascertain the metes and bounds of the subject matter claimed therein.

Claims 26, 29 and 32 in particular are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements include those required for configuring the voids to trap neutrons. It is clear from the Specification that the voids are not capable of independently functioning, nor are they intended to independently function, as supplementary neutron moderation elements.

It is not clear what is meant by “a channel having four sides representing sides of the bundle and having an opening therein” (claim 24). The sides of the channel may constitute the sides of the bundles, or not. The channel lacking openings is not a channel, and so the “opening therein” may arguably refer to the bundle, rather than the channel. The opening may also refer to a hole transecting the body of the channel. Furthermore, it is clear that the fuel rod subsets are not formed as rings, and yet the claim recites that the group consisting of all of the mentioned rods are arranged as a plurality of concentric fuel-rod rings. Given that the short-length fuel rod subsets have no defined faces, it is not clear how they can be in a facing relationship, or what such a relationship might signify (claims 24 and 28). Moreover, the term “triangular orientation” lends itself to spurious interpretations not within the scope of the disclosed invention. It is not clear to what the “corresponding outermost row or column of the matrix” of claims 28 and 31 corresponds.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 24-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Aoyama et al., Orii et al., or Koyama et al. in view of Ueda et al. and Johansson et al.

The primary references each show a structure that encompasses the basic inventive concept of the current application, i.e., a fuel bundle having water passages with circular or square cross-sections located either centrally or proximal to the center (See Aoyama et al., Figs. 8 and 21; Orii et al., Figs. 2 and 11; and Koyama et al., Figs. 11 and 12). Note the statement that “short length fuel rods may be differently arranged from the arrangement of FIG. 21 if the short length fuel rods are arranged both in the positions in the outermost tier and in positions adjacent to the water rods” (Orii et al. column 16, line 39+), which shows that the Orii et al. disclosure

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U.S.P.Q. 594; *In re Best et al.*, 195 U.S.P.Q. 430; and *In re Brown*, 173 U.S.P.Q. 685, 688. It would have been obvious to one skilled in the art at the time of the invention to combine the aforementioned teachings in order to provide the benefits that are the disclosed objects of all of the referenced prior art, particularly an improved shutdown margin.

Conclusion

6. The prior art made of record in previous correspondence and not relied upon is considered pertinent to applicant's disclosure.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (517) 272-3079. The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AA

Mark Hellman

11/2/2005

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November 1, 2005